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OBSERVATIONS

ON

SOME MODERN SURGICAL PROCEDURES

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OBSERVATIONS ON SOME MODERN SURGICAL PROCEDURES.*

By J. E. SUMMERS, Jr., M. D.

I beg the forgiveness of the Society for the failure in my duty as chairman of this section in not making the customary report on progress. The time allowed for rendering such a report is too brief to do the subject justice, so I will only consider two or three of the more important modern surgical procedures.

A question which to-day is attracting great attention, and is certainly of as much moment as any in the field of medicine, is that of the best method to follow in the *operative* treatment of acute intestinal obstruction.

Starting out with the proposition that any cause producing acute intestinal obstruction not amenable to the ordinary recognized methods of treatment, viz: Massage, posture, injections, opium, etc., demands abdominal section.

To narrow down the particular point to which I intend to confine myself, obstructions such as by bands removable by division; enteroliths and foreign bodies by incision and subsequent suture of the gut; intussceptions which can be relieved; reducible internal hernia —in fine, only lesions requiring either an artificial anus above the seat of obstruction, resection of the occluded portion, or an anastomosis of those portions of the gut above and below the seat of obstruction, can within the limit of this part of my paper be considered.

The formation of an artificial anus is only good practice when made to prolong life and save suffering in cases of malignant disease in the lower part of the intestinal tract, which suddenly change symptoms of chronic for those of acute obstruction; or an artificial anus may be made in cases of obstruction from other causes, the condition of the patient and a high grade of intestinal distention above the seat of obstruction admitting of no extended procedure or search of the cause and seat of obstruction at the time of operation; or where at the abdominal section the seat of obstruction cannot be found—the rule to follow is to open that part of the distended gut which the condition of the patient and anatomical and operative knowledge will bring you nearest the proximal point of the seat of obstruction. The mechanical part of this operation I will not discuss. The varieties are found in works devoted to operative surgery.

The formation of an artificial anus is merely palliative, although a few recorded cases prove that after its performance nature has re-established the natural passage of the fæces.

When, for gangrene, tumor, volvulus or stricture, removal of a portion of the gut is demanded, or in the judgment of the surgeon the best practice, the question of how to do this most rapidly and safely must be decided. In an exhaustive paper by Dr. B. F. Curtis, in the May, 1888, number of the Annals of Surgery, it is clearly shown from an analysis of a large number of cases operated upon with modern antiseptic precautions, that:

"One of the principal causes of the high death rate is the delay which takes place in putting the patient in charge of the surgeon. This delay is not to be measured merely by the lapse of time, but by the failure of the patients' strength, and the failure depends upon the severity of the symptoms quite as much as upon their duration."

Curtis showed that although the operation may be done early, when the patient is in fairly good condition, yet in 45 such cases:

"Thirteen died of shock; in 3 cases the unusual length of the operation may be assumed to have been the cause of death, and in 17 cases sepsis probably due to the operation was the cause of death. In 12 cases the cause could not be definitely ascertained, but as the majority died within twenty-four hours after the operation it was probably shock and exhaustion."

I cannot occupy the time required for a study of statistical tables. Any surgeon whose experience has brought him in contact with many of the diseases and injuries within the abdomen, amenable to operation, knows that his success in dealing with such cases has been in proportion as he has been able to operate early, rapidly and with cleanliness. This is especially true of intestinal obstruction.

*Report on Progress in Surgery.

The usual method, circular enterorrhaphy, *i. e.*, suture of the divided ends of the gut and mesentery by the Lembert suture, or one of its modifications, is the only operation

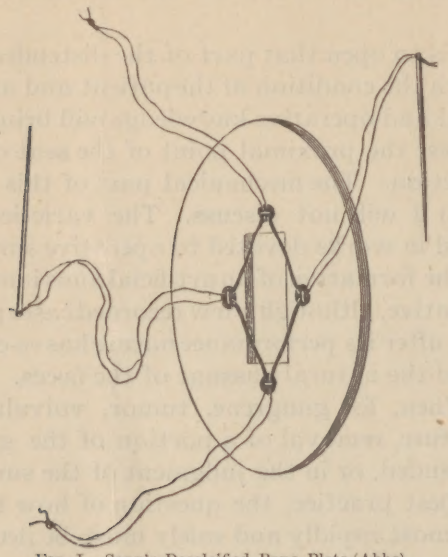

FIG. I.—Senn's Decalcified Bone Plate (Abbe).

after resection, whereby the function of the intestinal tract has been restored in the human subject. I must except an operation I saw Billroth perform successfully some six years ago, where he, after resecting a pylorus, closed the divided ends of stomach and duodenum and then performed a Wolfler operation, a gastro-enterostomy, joining an incision in the greater curvature of the stomach to a similar one in the upper part of the jejunum by the Czerney-Lembert suture.

Senn has successfully performed on animals an operation in which he fastens to the edge of the divided gut, by a continuous cat-gut suture, a rubber ring which has been slipped into the gut (the ring is made from a soft, pliable rubber band by fastening the ends together with two cat-gut sutures). The principle of the operation is the same as Joberts', *i. e.*, an invagination, so the rubber ring must be the length of the intussusception ⅓–½ inch. As it is the lower margin of the ring, which is stitched, this prevents the bulging of the mucous membrane.

"The ends of the bowel are now brought in contact and fastened together with four cat-gut sutures, which are placed equidistant from each other. Invagination is now made by gently pushing the ends of the bowel in opposite directions, being careful to push the ring sufficiently deep so that its upper margin is grasped by the neck of the intussuscipiens. A few superficial sutures are applied simply for the purpose of preventing disinvagination."

Senn claims this operation can be done in ten minutes, provided everything essential is at hand. This may be so on dogs, but in the human subject more time and care is demanded by the condition and lesion calling for an operation. He still further recommends surrounding the line of junction with a flap of omentum as an additional safeguard.

Senn extended our knowledge by bringing before the profession, apparently the most important of all proceedings in operative treatment of acute intestinal obstruction, and which is applicable to all varieties and posi-

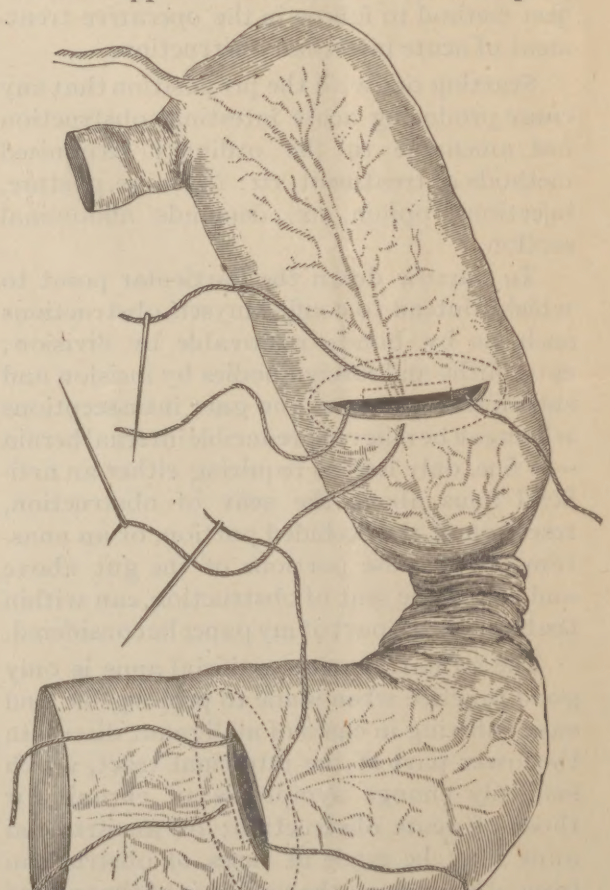

FIG II.—Senn's Plates Inserted (Abbe).

tions of this lesion, except in the lower part of the sigmoid-flexure and rectum.

The operation is in principle an enterotomy where the suture of the gut, always a

tedious and difficult operation, is replaced by what Senn calls an intestinal anastomosis. Those portions of the bowel nearest above and below the seat of obstruction whose surfaces can be approximated are drawn forward into the abdominal incision and secured by an assistant; or a piece of antiseptic gauze is passed through the mesentery on the proximal and distal sides of the obstruction and tightened sufficiently around the gut to occlude its lumen, thus shutting off the field of operation from the remainder of the alimentary canal.

"The bowel on the proximal side is incised on the convex surface to the extent of an inch and one-half * * * and the bowel on the distal side incised in a similar manner. Into each of these incisions a decalcified, perforated bone plate is inserted, and with the lateral sutures armed with a round needle the margin of the wound is transfixed. After the plates and satures are in place, the loops are thoroughly disinfected and the serous surface to the extent of the size of the plates are lightly scarified with the point of a needle, when the wounds are placed *vis-a-vis* and the corresponding four threads tied together with sufficient firmness to secure perfect coaptation of the serous surfaces. The sutures are cut short and their ends buried as deeply as possible by pushing them in between the approximated bowels with a director or blunt scissors. A few superficial stitches of a continued suture will enhance the safety of the operation. In this manner an anastomosis is established with the exclusion of probably only a small portion of the intestinal tract. The temporary ligatures above and below the obstruction are removed, the gut carefully washed and returned into the abdominal cavity."

This method is applicable after a resection of the gut for gangrene, injury or a new growth. The divided ends of the gut are closed by a continuous suture and an anastomosis established. Abbe recommends that in doing this the sutured ends should be placed so as to be directed in opposite directions, thus retaining the natural peristaltic force.

There are at present drawbacks to the use of the decalcified bone plates, and then they have their faults. I will illustrate the former: A lady had been admitted into the Clarkson hospital suffering with chronic intestinal obstruction, and deeming a laparotomy proper, I telegraphed to Milwaukee for some bone plates in order to be prepared to give my patient the advantage of their use if indicated. After waiting five days, and no plates having arrived, I operated. It was not until three days later that the plates reached Omaha. Therefore, as the plates are not to be had away from the large supply depots, and are kept on hand by few surgeons, they will not be used generally in the surgery of acute intestinal lesions.

The faults of the plates are the small size of the openings, and their limited elasticity. Abbe, of New York, has overcome, I think, all the drawbacks and defects of the decalcified bone plates. He recommends cat-gut rings, which can be made in a few minutes by any surgeon; they are very elastic, and the size of the openings is of course greater than in the plates. "They are made of the heaviest cat-gut, softened in hot water until it ceases to twist upon itself. It is then formed in a ring of four strands on the ends of three fingers, and wound over and over with the same sized gut tightly applied. When completed, it is, as you see, stiff and flat, with no disposition to curl. The threads are quickly and simply adjusted around the ring and insure its making a firm pressure until it has dissolved in the bowel. The ring, if made to encircle the ends of four fingers will be competent to establish a large opening in the

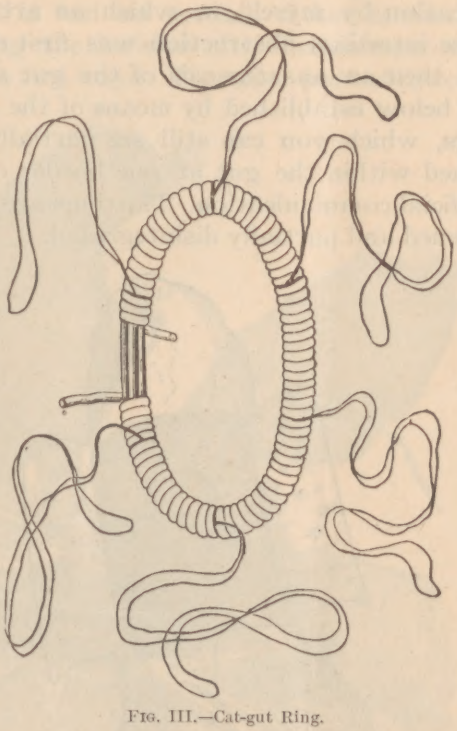

FIG. III.—Cat-gut Ring.

colon." Fine cat-gut is better than silk for the threads, because on account of its swelling there is less danger of leakage and infection.

I take great pleasure in exhibiting to you some of Senn's decalcified bone plates as well as the cat-gut rings of Abbe, in order that you may more clearly understand their use, and I wish also to have you examine this beautiful specimen, which was removed from a coach dog killed nine days after a successful operation by myself, in which an artificial acute intestinal obstruction was first made, and then an anastomosis of the gut above and below established by means of the Abbe rings, which you can still see partially attached within the gut at one border of the artificial communication. The rings are much softened and partially disintegrated.

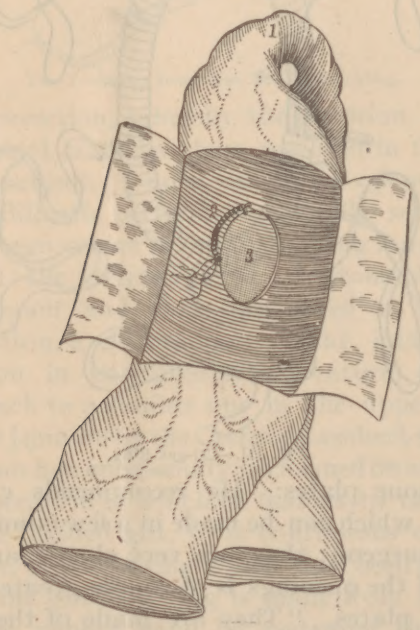

FIG. IV.—Anastomosis of dog's gut.
1. Acute obstruction. 2. Disintegrated cat-gut rings. 3. Communication between loops.

Senn has operated on the human subject four times and Abbe twice. From my own trials on dogs I am convinced that the cat-cut rings are of superior value to the decalcified bone plate.

HERNIA.

At our last meeting at Lincoln, I advocated an operation for the radical cure of inguinal hernia known as McBurney's, believing this operation to be in principle a better one than the operations of Banks, Macewen or Czerney, or their modifications. During the past year the chief admirers of these operations, and especially that of Macewen in New York, have quite abandoned them and are now proclaiming themselves strongly in favor of the McBurney operation. This was evinced in a discussion following the reading of a paper on this subject by McBurney before the New York Academy of Medicine, February 21st of this year.

The paper was published in the *Medical Record* of March 23rd and a number of excellent cuts given, several of which I have had copied in order to show the steps of the operation which I consider so important a procedure, and I am fortunate to be able to show you a man upon whom I did this operation in the Clarkson Memorial Hospital, Omaha, on April 6th, who is on his way to his home in Butte City, Montana. (This man had been twice operated upon by another surgeon by the Heaton, or injection method, with only temporary benefit.)

The objects to be sought in order to bring about a radical cure of a hernia are:

First. The complete removal of the sac, that is, the restoration to the peritoneal surface of the abdomen, at the point where the hernia begins of the same smooth, tense condition that exists at other parts of the inner lining of the abdominal walls, "and thus remove the predisposing cause to a return, i. e. peritoneal laxity at the internal ring."

Second. Having done this, means must be taken to give the peritoneum the most unresisting support.

Only two methods other than McBurney's can possibly produce a complete obliteration of the *interior* of the sac. One, Ball's aims to do this by seizing the sac high up in the ring and twisting it as one might an artery. There is danger in this of possibly twisting an adherent piece of omentum or gut, and then, in cases of congenital hernia or where we have to deal with a diseased or injured sac, the operation is unfeasible or illy suited.

Macewen, as you remember, dissects out the sac, loosening the peritoneum around about the internal ring; then he passes a suture lengthwise through the sac, bringing

the needle through the abdominal wall above the internal ring. The skin of the abdomen is drawn upwards so that the needle emerges within the area exposed by the upper end of the incision. This throws the sac into folds and it is drawn up within the abdomen, forming a kind of cone with its base downward, "surrounding the circumference of the internal ring." The sac is obliterated but there is left no smooth surface of peritoneum.

This method cannot obviously be employed in the same class of cases where Ball's is inapplicable. In order to treat the peritoneum as desired, McBurney exposes the internal ring by dividing the anterior wall of the canal. The sac is carefully dissected out and opened, contents returned into abdomen; then with a finger passed into the sac to the internal ring to prevent inclusion of intestine or omentum, an assistant passes a stout cat-gut ligature around the sac, which is drawn upward by forceps, and ties it tightly just over the tip of the finger; the sac is cut away, leaving pedicle enough to prevent slipping off of the ligature. In the cases inapplicable to the other two operations, Ball's and Macewen's, the sac can be cut away and its neck sewed with cat-gut.

The second indication, support, is met by sewing all the tissues of the periphery of the wound except the lower scrotal part together with interrupted sutures. A kind of button-hole is formed; after the edges of the scrotal part of the incision have been sutured together, this button-hole is packed with iodoform gauze and allowed to heal by granulation, a firm broad cicatrix resulting. The drawback to this method of repair is the time consumed, the patient being required to remain in bed six weeks. Other methods of closing the incision after hernia operations fail in two ways: The upper part of the canal remains as before the operation, thus inviting a return of the hernia, or in attempts to obliterate by suture, too weak a union results to afford sufficient resistance to a return of the hernia. Even tying off, twisting or folding the sac after dividing the ring would not offer so good a prospect of cure if the raw surfaces were immediately brought in direct contact, but would certainly be a better practice than any of the other methods of suturing I am acquainted with.

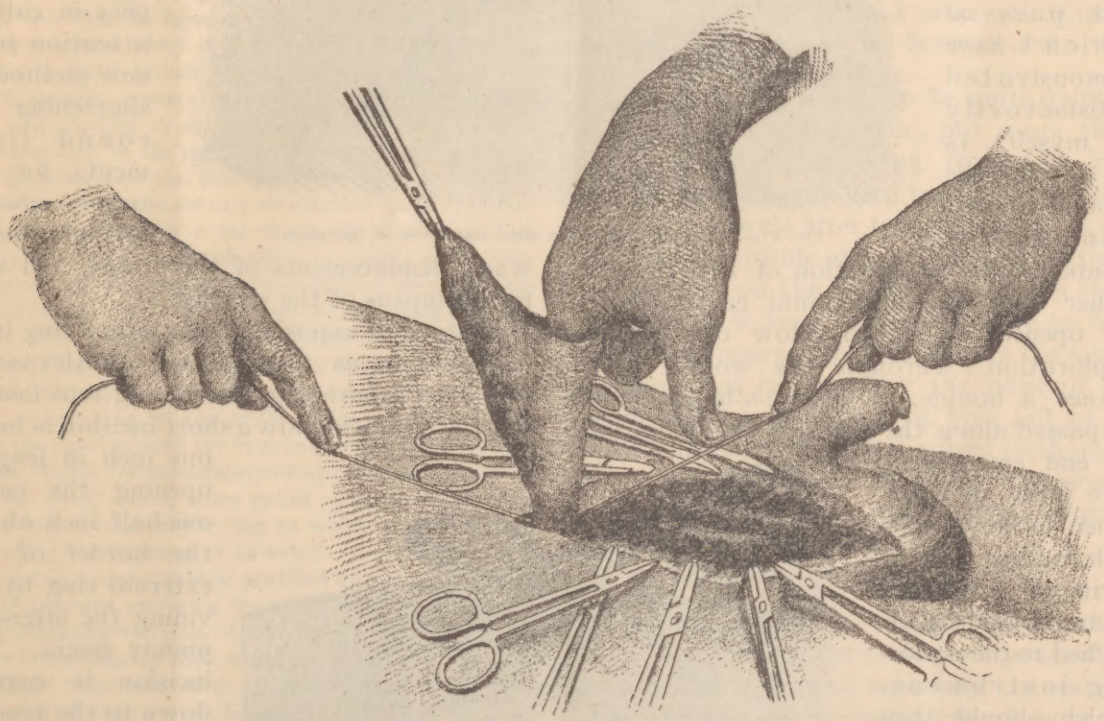

FIG V.—Ligation of neck of sac.

In the case I show you the sac was cut too short, and the ligature slipped off, necessitating the seizure of the periphery of the divided

sac by a number of clamp forceps, and considerable trouble was experienced before the ligature could be reapplied.

GUN-SHOT WOUNDS OF THE LIVER.

We learn most from our failures, and a thought suggested by one of my own, leads me to call attention to a method of controlling hemorrhage in cases of gun-shot wounds of the liver, where the wound of exit from the liver is so high up on the under surface that neither sutures nor gauze tampons are practicable. My suggestion (the mechanical part of which I have demonstrated satisfactorily to myself), is to expose the wound of entrance either by a laparotomy or resection of the ribs. In either case the abdominal cavity should be opened so as to allow of thorough exploration. Through the wound of entrance a bougie, or bougie-a-boule, should be passed along the track of the bullet until its end emerges at the point of exit, when either a suitable rubber tube or strip of antiseptic gauze should be attached to the exploring instrument, which should then be withdrawn so as to bring the tube or gauze within the whole track of the wound. A tamponing of the wound would then be made to control, at least, fatal hemorrhage. This may seem the fancy of an idealist. It is not, so far as the operative procedure on the cadaver is concerned. In the fatal case of hemorrhage from the liver to which I have referred, and which I reported, together with a number of other abdominal sections in the *Pittsburg Medical Review*, although the section was done for a supposed wound of the intestine, I cannot but believe that had the above suggestion been carried out the fatal hemorrhage, which I was able to control only temporarily by iodoform gauze packed in between the liver and meso-colon and brought out at the lower angle of the transverse incision, would not have occurred.

FIG. VI.—Button-hole Appearance after Completion of Operation.

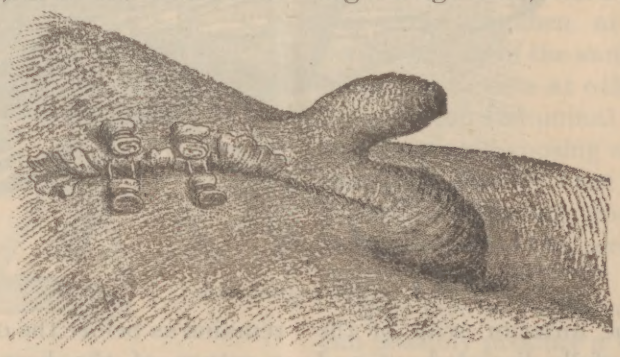

FIG. VII.—Wound Packed with Iodoform Gauze and Edges Approximated.

ALEXANDER'S OPERATION.

Inasmuch as the inguinal canal is the property of the general surgeon, as well as of the gynecologist, I will not be going outside of the sphere of the section on surgery in calling attention to a new method of shortening the round ligaments, for anterior, posterior or downward displacements of the uterus, and also for prolapsus of the ovaries.

Instead of exposing the external ring by a free incision as first advised by Alexander, and then separating, shortening and fastening the ligament, now a short incision is made one inch in length, opening the canal one-half inch above the border of the external ring by dividing the inter-columnar fascia. The incision is carried down to the tendon of the external oblique muscle—the external ring is recognized by the finger, and then an incision one-fourth to one-third of an inch is made through the inter-columnar fascia. One strabismus hook is made to draw the outer side of the wound in the fascia outwards, while with another the round ligament enclosed in its fascia is hooked up.

At the last meeting of the American Medical Association, Kellogg explained the minute details of the procedure as follows:

"Passing the hook down on the outside of the gray-

ish mass which is seen through the opening in the fascia, press this mass a little toward the center of the body and push the hook down to the lower part of the canal, half or three-quarters of an inch below the level of the tendon of the external oblique. Turning the point of the hook inward, a mass of tissue is easily secured and brought out through the opening in the fascia, which will usually be recognized at once by its grayish color and the great number of anastamosing blood vessels as the structure containing the ligament. It is of great importance that the wound should be wholly free from blood, and the dissection a clean one, as by this means only will the natural color and appearance of the structures of the ligaments be so preserved as to enable one to recognize them. The structures hooked up usually consist of the ligament surrounded by a sheath of fascia, with its accompanying nerve and blood vessels. To make sure that the ligament shall not escape back into the canal, from which it is not always easy to recover it, slip a thick carbolized silk thread underneath the whole mass by means of an aneurism needle. The ends are tied together or secured by a pair of snap forceps. The next step in the operation is to carefully enucleate the ligament from the membrane surrounding it, which is easily done by the aid of a strabismus hook. On making a longitudinal slit in the fascia, the smooth, glistening surface of the round ligament is usually readily discovered, and the process of enucleation may be completed in a few minutes. In exceptional cases, the ligament, even at this point, proves to be a mere tendinous thread. On this account great care should be taken not to sacrifice any chance for securing the ligament by cutting or breaking off any of the fibres which dip down into the canal toward the internal canal. By repeated trials, even in the most unpromising cases, a fibre will at last be found which, when pulled upon, does not drag upon the borders of the ring to which the fascia surrounding the ligament is attached. Drawing this outward, the operator will be gratified by seeing a smooth, glistening cord emerging from the wound in the direction of the internal ring. Carefully seizing this with the thumb and finger, a little steady traction will bring the ligament fully into view. The ligament may now be dropped into the wound, being still secured by the loop of silk. Place in and over the wound a mass of absorbent cotton, saturated with four thousand solution of mercuric bichloride. After securing the ligament upon the opposite side in the same manner, both the ligaments should be drawn out to the extent of three to five inches. The pouch of the peritoneum which forms the canal of Nuck will be seen gradually separating from the ligament as it is steadily pulled forward.

"The next procedure is the placing of the silver wires, which should be passed through the tendon of the external oblique crossing the inguinal canal, and including at least one-half the thickness of the round ligament. Special care should be taken to include in the silver sutures the pouch of peritoneum investing the ligament. Two silver sutures are sufficient. The slit in the inter-columnar fascia is now closed by two or three carbolized silk sutures. At least two of these are also made to include the ligament. Before tying the last suture, the outer portion of the ligament is tucked into the outer end of the inguinal canal. If the ligament has been greatly bruised, however, or if the vessels have been tied, so that its nutrition has been cut off, the ligament should be brought out through the lower angle of the wound. This is very rarely necessary, if the operator is skillful. The deep and superficial fascia are now carefully brought together by a continuous suture of small chromicized catgut. The skin is united in a similar manner, the silver sutures twisted, and the operation is completed. The uterus is supported in position by a lever pessary, which is fitted before the operation. If necessary, this is held up by the hand of an assistant, during the securing of the ligaments by sutures. In cases of retroflexion, the fundus must be held forward by means of a sound, and afterwards kept in place by a stem pessary, unless the flexion is a rigid one, in which case rapid dilitation should be performed upon the ligaments and a stem pessary placed in position."

This operation is said to be quite painless under cocoaine anæsthesia; not more than five to seven grains being required. Hot vaginal injections are used two or three times a day; the bowels after two or three days are kept lax by suitable means. The silver sutures are removed on the seventh or eighth day. The patient is kept in bed for three or four weeks. The operation of shortening the round ligaments has its place for the relief of the lesions above noted, yet it will fail of its object unless auxiliary recognized methods of treatment go hand in hand. Personal, although limited, experience in this operation makes me think highly of it.

PHELPS' OPERATION.

Certainly there is no deformity which causes the practitioner more annoyance than that of club-foot, and especially the variety known as varus or equino-varus. It is to the treatment of these forms of club-foot to which I wish to direct attention—to an operation devised by Phelps, of New York.

The principle involved is the free division of all restraining tissues by an open aseptic incision; the resulting gap being allowed to heal under Schede's method (organization of the moist blood clot.) This form of repair I discussed in a paper published in the Transactions of this Society in 1886.

The operation is thus performed: After a sub-cutaneous tenotomy of the tendo Achilles, an incision is made commencing immediately in front of the tip of the inner malleolus,

extending downward one or two inches. This incision divides all the soft parts down to the bones. From within this incision are divided the tendons of the tibialis anticus, tibialis posticus, flexor longus digitorum, flexor longus pollicis, the bellies of the flexor brevis digitorum and abductor pollicis, the plantar fascia, the long plantar and deltoid ligaments, nerves and blood vessels. If the plantar artery is divided, its ends should be secured before the application of the dressings, which would otherwise soon become soaked after the removal of the Esmarch's tourniquet—this must be applied before commencing the operation. After the application of the antiseptic dressings, the foot is held in the corrected position (exaggerated), and a plaster bandage applied. In from two to three weeks the plaster and dressings are removed and then re-applied to remain two to four weeks longer, when on removal the wound will be found entirely healed. All that is then essential is a strong, stiff-backed laced shoe, or perhaps some form of brace to be worn until the parts have gained sufficient tone to be left to themselves. I have operated a number of times according to this method, and find it superior to all others; curing cases which seemed to demand the removal of a wedge of bone in order to bring the foot into the correct position.

BRAIN SURGERY.

Before closing my report, I cannot refrain from reminding you of the brilliant work being done in brain surgery. We owe most of our knowledge to Horsley and Macewen abroad, and to Weir and Keene at home—I mean as operators for the removal of growths within the cranial cavity. Others have done successful work in this field both in France and Germany. The physician shares the glory of the surgeon; for in most of the cases reported the existence and location of a growth was determined by the physician, the surgeon acting as a trained mechanic, carrying out the principles of his art. This was likewise so in the wonderful case of the successful removal of a tumor of the cord by Mr. Horsley, the diagnosis had been made by Dr. Gowers.

As we in our young state have as yet few experts whose whole study is bent in one direction, it behooves us as surgeons to watch carefully the progress in medical branches, so as to apply it in our art. Truly, a good surgeon must be a good physician, especially if he practice general surgery.